DOCUMENT RESUME

ED 149 990 SE 023 460

TITLE	Environmental Education, Values for the Future: Environmental Ethics. Grades 9-12.
INSTITUTION	Illinois State Office of Education, Springfield.
SPONS AGENCY	Bureau of Elementary and Secondary Education (DHEW/OE), Washington, D.C.
PUB DATE	77
GRANT	IOE-551-2-75
NOTE	45p.; For related documents, see SE 023 448-457 and SE 023 459-465
EDRS PRICE	MF-$0.83 HC-$2.06 Plus Postage.
DESCRIPTORS	*Environmental Education; *Ethics; *Instructional Materials; Interdisciplinary Approach; *Learning Activities; Natural Resources; Science Education; *Secondary Education; *Teaching Guides; Values
IDENTIFIERS	Elementary Secondary Education Act Title III

ABSTRACT

This booklet on environmental ethics is one of a series on environmental education for grades K-12. In this booklet for high school students, the idea of a personal value system is developed and tested. Five basic behavioral objectives are given, along with a listing of appropriate subject areas. Three activity options are related to each concept. Information for the activities includes materials and resources, procedures, and discussion questions and activities. The activities are interdisciplinary and include surveys, films, book reports, and field trips. Sample data sheets, survey forms, and illustrations are given. (MA)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ENVIRONMENTAL ETHICS

ED149990

U S DEPARTMENT OF HEALTH
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Michael D. Teeley

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND USERS OF THE ERIC SYSTEM."

ENVIRONMENTAL EDUCATION

VALUES FOR THE FUTURE

ANTIOCH COMMUNITY SCHOOL DISTRICT 34

TITLE IVC ESEA

SE 023 460

TABLE OF CONTENTS

Page

Explanation of Concept area 1

Synopsis

Ethics 14: At the completion of this unit the student will be able to list examples of how the diversity of man's surroundings contributes to a healthy environment and is necessary for the psychological well-being of man.

Option 1 - Students use their reactions to a changing environment to compose a poem. .. 3
Option 2 - Students view two different visual presentations and assess the real worth of trees to man, both economic and psychological. 4
Option 3 - Students survey the diverse needs of people in their community. 7

Ethics 15: At the completion of this unit the student will be able to list examples of wasted resources which should or should not be recycled or replenished.

Option 1 - Students trace the use of resources through a family tree of discovery, development, and waste. .. 10
Option 2 - Students explore by filmstrip and fieldtrip a variety of effects produced by man using resources unwisely. .. 12
Option 3 - Students place the recycling issue on trial using debate and a judge and jury. .. 16

Ethics 16: At the completion of this unit the student will be able to list examples showing that use of the environment may have an adverse effect upon the quality of man's life and ultimately upon his culture.

Option 1 - Students read Fail-Safe and By the Waters of Babylon and write about and discuss the environmental implications. .. 18
Option 2 - Students participate in a Values Continuum exercise which focuses on the understanding. .. 21
Option 3 - Students read The Andromeda Strain and write a paper on the issues involved, i.e. technology versus morality. .. 24

Ethics 17: At the completion of this unit the student will be able to give examples of why an essential aspect of all environmental ethics is a human ethic based on social justice for all individuals and groups.

Option 1 - Students become involved in values issues and examine their own value systems. .. 27
Option 2 - Students study by filmstrip and cassette energy sources and the potential of each source to meet our energy and quality of life needs. .. 28
Option 3 - Students study, by personal observation, the quality of life in their school and their neighborhood. .. 30

Table of Contents

Ethics 18: At the completion of this unit the student will be able to demonstrate that only when each of us lives a life guided by respect for the earth and all living things, now and in the future, will we be able to live in harmony with each other and our environment.

Option 1 - Students study television to determine its impact on our attitude toward human life. .. 33

Option 2 - Students view a film and explore their own feelings about the need for a quality environment. .. 37

Option 3 - By means of a film and a letter to the president, the students gain new insights into the quality of life issue. .. 39

EXPLANATION OF CONCEPT AREA

ETHICS - The goal of any environmental education program should be to assist students in the development of a system of values consistent with our role as stewards of our environment.

To this end we begin with the development of a basic idea of individual needs and the need for sharing. From this we then explore the wonders of our environment.

We then build the concept of stewardship based upon our personal lifestyle and attitudes.

In grades 6-8 we present the idea of man's role in helping to preserve the natural order and the importance of a pleasant environment for now and the future.

In high school the idea of a personal value system is developed and tested for its applicability to our own society and the world environment.

ENVIRONMENTAL ETHICS 14

BEHAVIORAL OBJECTIVE:

At the completion of this unit the student will be able to list examples of how the diversity of man's surroundings contributes to a healthy environment and is necessary for the psychological well-being of man.

SUBJECT AREAS:

Biology, Social Studies, English

2

OPTION #1 - 4-5 Days

NO MATERIALS AND RESOURCES NEEDED

PROCEDURE:

1. The first day begin with a bare room. Ask the students to write a poem on how they feel.

2. The second day add some flowers or plants or art to increase the beauty of the room. Have the students again write a poem on their feelings. Each day increase the beauty of the room and have the students write poems. Add music on the intercom or on a tape recorder.

3. On the last day, compare poems to determine if the beauty of the rooms adds to the types of poetry.

DISCUSSION QUESTIONS:

1. How have the poems changed? Does this reflect an individual's psychological need for beauty?

2. How could we alter the environment and change the poetry?

3. Where can we see some influences on people by their environment as part of our society?

OPTION #2 - 4-5 periods

MATERIALS AND RESOURCES:

2 Filmstrip Projectors
Filmstrips: The Rivers Must Not Die (Frames 25-54) No narration
Colors in Nature (Any 29 frames) No narration
(Available Environmental Education Office)

PART A

PROCEDURE:

1. On a village map outline areas around the school and make a tree census. Identify kinds and number of the major trees. Groups of students can be assigned to various areas. Prepare an identification map of the area and file for reference in future years.

2. Prepare a compilation of your results on a sheet showing the total number of trees and a breakdown of the numbers of each difference species.

DISCUSSION QUESTIONS:

1. How many American or slippery elms did you find in your census?

2. A few years ago the elm was a major shade tree in the area. Where are they now?

3. What would have happened if all of our trees had been elms?*

8. Why is it beneficial to have many different kinds of trees?

*NOTE: A recent statement indicates that all of the coconut palms in Dade County, Florida will be dead within a year because of an uncontrollable infection.

PART B

PROCEDURE:

1. Divide the class in half and put them back to back.

2. Project the two filmstrips (Slides 25-54) and any 29 slides, so that only half the class can see each.

3. Look at the two filmstrips and ask the students to record a one or two word reaction to each frame.

4

OPTION #2 (Cont'd)

DISCUSSION QUESTIONS:

1. Identify some biological needs fulfilled by trees.

2. Identify some psychological needs fulfilled by trees.

3. Why is it hard to convince a politician that a tree can be as important as a road. See Chart 1.

4. Lakehurst and Hawthorn shopping centers utilize trees and plants inside their shopping malls. Why?

5. In the overall scheme of things does one tree make a difference? If the class says no then ask the following series of questions: A) How many trees are in the Smoky Mountain National Park? B) How many trees are in Antioch? C) How many trees are on the school grounds? D) How many trees in _____ ? (pick an area of one or two.) E) How many trees in the immediate downtown area?

6. After asking the above series of questions ask if there is a point where one or two trees makes all the difference in terms of beauty.

7. Are we saying never cut down a tree? Or--?

Paul Webster, Biology Teacher
Bryan High School
Bryan, Ohio

ARGUMENTS FOR SAVING URBAN TREES

A. The releasing of water into the atmosphere by transpiration. A 60 foot oak releases 150 gallons of water into the atmosphere per day allowing storm sewers to be smaller and erosion reduced.

B. The reduction of temperature for homes and pedestrians due to shade. A savings on air conditioning can be realized.

C. The cost of sound insulation can be reduced due to the sound barrier trees provide.

D. The oxygen produced and the carbon dioxide reduced in the process of photosynthesis.

E. The increase in property values due to trees. Loss of these values may result in lower income occupancy eventually.

F. The psychological value that trees offer by separating traffic from pedestrians.

G. The sentimental value in honor of the early settlers who planted the trees.

H. The aesthetic worth of trees.

I. The trapping of automobile and other pollution particulates on the undersurface of leaves of trees.

BASIC VALUE OF PERFECT TREES BY SIZE

10 inch diameter	$ 474	35 inch diameter	$ 5,772.
15 inch diameter	1,062	40 inch diameter	7,542.
20 inch diameter	1,884.	45 inch diameter	9,549.
25 inch diameter	2,946.	50 inch diameter	10,860.
30 inch diameter	4,242.		

SPECIES VALUE PERCENTAGES

Norway Maple	80%	Hickory	60%	American Elm	60%
Sugar Maple	100%	Red Pine	80%	Chinese Elm	40%
Silver Maple	40%	Box Elder	20%	Slippery Elm	20%
Red Maple	80%	Catalpa	40%	Thornless Honey Locust	60%
Basswood	80%	Oak(any spec)	100%	Walnut	60%
Mulberry	40%	Red Bud	100%	Ironwood	100%
Red Mulberry	20%	Ash	60%		

TREE VALUE FORMULA EXAMPLE

Species or Variety - Norway Maple
Diameter - 10 inch
Basic Value - $474.00
Species Value - 80% x $474.00 = $379.20
Condition Value - 70% x $379.20 = $265.44 Value of Tree - $265.44

6

OPTION #3

MATERIALS AND RESOURCES:

Survey Form

PROCEDURE:

1. Give each student a copy of the survey form (start this on Friday).

2. Explain each point on the survey and the reason for the wide variety of items.

3. Assign each of them a given task related to the form: e.g. 10 responses to question 1, or two complete forms.

4. Arrange the survey so that you get large quantities of data for the discussion.

5. Give them the weekend to complete the survey, or take one class period to survey the homes near school on foot.*

6. When all the data is collected have each class tabulate the data with the following headings:

   # of types of indicators
   # for each type of indicator

7. Display the data for each total so that you may discuss the survey.

*NOTE: If you survey the area adjacent to the school you will not have a great range of diversity.

DISCUSSION QUESTIONS:

1. Are homes the product of the people living in them, usually?

2. Do people modify their environment to suit them? How?

3. Why do we spend millions of dollars on landscaping and trim in the United States?

4. Are our cars the result of our personal choices and needs? Explain.

5. What are some examples of using the automobile to satisfy our needs?

6. What do we mean by diversity? List some examples.

7. What differences do you see in your choices and those of others?

8. How different are the "strokes" preferred by people?

9. Did you see any homes without trees or grass? Explain.

10. Describe your ideal physical setting.

TRANSPORTATION:

FORM: BIKE _____ MOTORCYCLE _____
CAR _____ TRUCK _____

TYPE: SPORT _____ COMPACT _____ INTERMEDIATE _____
FULL SIZE _____ LUXURY _____ WAGON _____

COLOR: RED _____ BLUE _____
GREEN _____ BROWN _____
YELLOW _____ BLACK _____
WHITE _____ GRAY _____

VEGETATION:

TREES: EVERGREEN _____ DECIDUOUS _____

COLOR: RED _____ GREEN _____
YELLOW _____ OTHER _____

SIZE: SMALL (UNDER 10') _____
MEDIUM (10'-20') _____
LARGE (OVER 20') _____

HOUSING:

CONSTRUCTION: ALL BRICK _____ BRICK & SIDING _____
ASBESTOS SHINGLE _____ ALL WOOD _____
ALUMINUM SIDING _____ STONE _____

COLOR: WHITE _____ BLACK _____ BROWN _____ RED _____
YELLOW _____ GREEN _____ GRAY _____ BLUE _____

STYLE: RANCH _____ BUNGALOW _____ TWO STORY _____ OTHER _____

TRIM: WHITE _____ BLACK _____ BROWN _____ RED _____
YELLOW _____ GREEN _____ GRAY _____ BLUE _____

OTHER:

FENCES: PRESENT: _____ ABSENT _____

TYPE: PICKET _____ CYCLONE _____
LOG _____ PRIVACY _____ OTHER _____

ENVIRONMENTAL ETHICS 15

BEHAVIORAL OBJECTIVE:

At the completion of this unit the student will be able to list examples of wasted resources which should or should not be recycled or replenished.

SUBJECT AREAS:

Social Studies, Science, Mathematics

OPTION #1

MATERIALS AND RESOURCES

Beer can geneology (Chart Ditto)

PROCEDURE:

1. Read the beer can geneology.
2. Hand out copies to students.
3. Read again.
4. Open for discussion.

DISCUSSION QUESTIONS AND ACTIVITIES:

1. How dependent are we on natural resources? Show and explain the interrelatedness of all the steps.
2. What is recycling? Define on board.
3. If we were to recycle the beer can where would be begin?
4. What is eliminated in the overall process?
5. Have we preserved any of the environment - at what price (in terms of human resources)?
6. What is a natural resource?
7. How were things like iron ore, bauxite, coal, oil, etc. formed? Time factor?
8. Are these resources exhaustible?
9. If resources are exhaustible, does it make sense to conserve them?
10. Is recycling of method of conservation?
11. What types of materials are we presently recycling? To what extent?
12. Have student take one aspect of the geneology and make another. For example, in Marriage 2, have students make geneology for "Burned Fossil Fuels".
13. Are there other resources being used up everytime we process bauxite?
14. List 3 positive aspects of recycling and then list 3 negative. Which seem more important to consider?
15. Have student make a geneology for a piece of paper* or a pop bottle. For a real challenge have student make a geneology for a car. Divide class into groups - a tire group - a plastics group - a metal group, etc.

10

*paper or pulp wood is being replenished very rapidly.

BEER CAN GENEOLOGY

IN THE BEGINNING GOD CREATED THE

EARTH — MAN

1ST MARRIAGE

NATURAL RESOURCES (BAUXITE (ALUMINUM)) ⟷ MINE INDUSTRY

CHILDREN

PROCESSED ALUMINUM | JOBS | SHIPPING | PRODUCTS | SCARRED LAND

2ND MARRIAGE

PROCESSED ALUMINUM ⟷ CAN PRODUCTION COMPANY

CHILDREN

ALUMINUM CAN | JOBS | SHIPPING | BURNED FOSSIL FUELS

3RD MARRIAGE

ALUMINUM CAN ⟷ BEER COMPANY

CHILDREN

CAN OF BEER | JOBS | SHIPPING | BURNED FOSSIL FUELS

4TH MARRIAGE

CAN OF BEER ⟷ DEMAND FOR BEER

CHILDREN

EMPTY CAN | SHIPPING | JOBS (BARTENDERS, ETC.) | BEER BELLY

5TH MARRIAGE

EMPTY CAN* ⟷ IGNORANCE OF RECYCLING

CHILDREN

LOST NATURAL RESOURCE THAT TOOK MILLIONS OF YEARS TO MAKE | WASTED CAN | LITTER

*TWENTY FIVE PERCENT OF ALL ALUMINUM BEVERAGE CANS SOLD IN THE UNITED STATES WERE RECYCLED IN 1975. $26 MILLION WERE PAID TO RECYCLERS FOR THEIR EFFORTS.

//

PTION #2 - Five Days

MATERIALS AND RESOURCES (*Optional)

A site which has been eroded because of stripping of vegetation and/or soil.

Prepared data sheets

"Succession"*, Film

"Romance of the Lumberjack"* Available Environmental Education Office, FS/C

Cameras and Film* (Polaroid or instamatic available from Environmental Education Office

PROCEDURE:

Note: The procedure outlined below uses all options. The teacher should delete or modify as the situation dictates.

PART I

1. Discuss the meaning of resources and list examples.

2. Show "The Romance of the Lumberjack".

3. Discuss the use of timber as shown in the filmstrip.

PART II

4. Prepare the students for the field trip to a denuded land site by explaining the data sheets prior to the trip. Visit the site.

   A. Fill out the data sheets looking for such factors as vegetation and animal life present and the desirable and undesirable aspects.

   B. Some items may be collected for discussion.

5. Return to the classroom and analyze data collected.

6. Prepare displays of collected materials.

7.* Show film, "Succession".

8.* Students may follow up with an essay on the topic, "What I think would happen to the denuded land site if left undisturbed for the next 1000 years."

DISCUSSION QUESTIONS:

PART I

Referring to a list of resources you have compiled and written on the board, discuss the following questions:

OPTION #2 (Cont'd)

1. Is it all right for man to use the Earth's resources or should they be "saved"?

2. What would you consider to be a safe level of usage for some of them?

3. Are soil, clean air and trees, resources?

4. Why is it necessary to use resources wisely?

5. What will ultimately happen if we don't?

PART II

1. Do you feel that the land at the denuded site was used wisely?

2. Who do you think benefited from the present use of the land?

3. Do you feel that the present use was the best use?

4. Could the area have been restored?

5. What long range effects could the present land use have?

6. If the land were left alone for the next 1000 years, what would probably happen? (succession would occur naturally)

7. What negative occurrences may be evident before natural succession is able to repair the damage?

8. What happens when massive areas are denuded?

9. What must we do to prevent disasters which occur as a result of denudation?

10. There is an old saying, "An ounce of prevention is worth a pound of cure." Do you feel that this statement applies to this site? (refer to the understanding)

NAME _____

DATA SHEET #1

We shall take a short trip to a local area that has been stripped of top-soil and vegetation. We shall observe this area carefully looking for various plant and animal species, desirable and undesirable effects and long range consequences of past practices.

List as many organisms and observations as you can. If you cannot name a certain species, make a simple sketch in the space provided.

Plant species present	Animal species present
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.

Undesirable aspects	Desirable aspects
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.

Other factors noted:

NAME_____

DATA SHEET #2
(ALTERNATE)
PLANT SURVEY

1. Describe location (top of hill, slope, base of hill, low land, swamp, water, low or high flats	3. Other trees in the area, percent of sunlight reaching the ground, number of rotting trees on the ground
2. Dominant tree cover, average height of trees, thickness of tree cover	4. Soil (sand, black dirt, clay, large rocks, gravel), percent of soil exposed
5. Brush - type, percent of cover, thickness	10. Liverworts - location, numbers
6. Grass - number of types, percent of cover	11. Lichens - location, percent of cover
7. Weeds - number of types, percent of cover	12. Protococcus - location, percent of cover
8. Ferns - type and numbers	13. Water, algae paints - type, percent of cover
9. Moss - types, where found, size of cover	14. Fungus - types, describe location, percent of cover
15. Other characteristics -	

15

PTION #3

MATERIALS AND RESOURCES

Information on recycling

PROCEDURE:

1. Assign the following roles to the class:

   a. Judge
   b. Protagonist (for recycling)
   c. Antagonist (against recycling)
   d. Jury (seven people)
   e. Three experts for each side (for and against)
   f. Timekeeper
   g. Remainder of the class is the audience and research staff.

2. Each student is given two periods to research the role assigned to him/her.

3. On the fourth day, hold a trial on the issue of recycling. Each side presents up to three witnesses and has a rebuttal period.

4. Follow the following order for the trial:

   a. Flip a coin to see which side begins first.
   b. Both sides are allowed two minutes for introductory remarks.
   c. First witness - three minutes.
   d. One minute of rebuttal questions
   e. Repeat steps c and d for all three witnesses.
   f. Continue with the first witness for the other side, again allowing three minutes.
   g. One minute of rebuttal questions
   h. Repeat steps f and g for all three witnesses.
   i. Allow both sides a two-minute summary.
   j. Jury votes yes or no - ten minutes.
   k. Audience votes yes or no - one minute.

DISCUSSION QUESTIONS

1. How should resources be used?

2. Is recycling more complex than it seems? Explain.

3. What prevents or aids recycling? Explain.

4. Where are resources used most efficiently? Why?

5. Is there an alternative to recycling? Explain.

6. What resources cannot be recycled or replenished?

ENVIRONMENTAL ETHICS 16

BEHAVIORAL OBJECTIVE:

At the completion of this unit the student will be able to list examples showing that use of the environment may have an adverse effect upon the quality of man's life and ultimately upon his culture.

SUBJECT AREAS:

English, Science, Social Studies

OPTION #1

MATERIALS AND RESOURCES

By the Waters of Babylon, Stephen Vincent Benet
Fail-Safe, Eugene Burdick and Harvey Wheeler
"Fail-Safe", motion picture version

PROCEDURE:

1. Assign By the Waters of Babylon for overnight reading. On the next day move into the structure of the story in such a way as you preserve as much as possible the subtlety of its development. The questions should gradually bring to light Benet's interesting handling of the dimension of time and the identify of New York City as " the place of the gods". The backward look from a future perspective will expose the ramifications of our present nuclear capacity. The story shows that man created an environment that spelled doom for the culture of North America and perhaps the whole world. The primitive remnants of this culture now think of this forbidden place only as the home of warring gods. Students should be asked to comment on whether the story holds forth any hope and whether they themselves are optimistic or pessimistic about man's ability to maintain a political and technological environment within which culture can survive.

2. After the discussion of By the Waters of Babylon, assign Fail-Safe. The length of time allowed for this reading will vary, depending upon the reading capacities of the group. Any interim project will suffice until the students are ready to discuss the novel. You may even wish to extend the time between the two discussions so as not to give the immediate impression that the two are part of the same unit. By separating the two discussions you will be in a better position to determine possible changes in student attitude. Hopefully, the more intense drama within the novel will cause some changes in the way the students view the nuclear threat. From a literary standpoint, it will be interesting to assess the effect that heightened drama can have on point of view.

3. In Fail-Safe we have a closer view of a kind of horror that Benet's story deals with from a more distant perspective. In the discussion of Fail-Safe, ask questions designed to expose the political and technological causes of the Fail-Safe dilemma. Other causes may come to light as well, but considerable attention should be given to the idea that the faith man has placed in technology is indeed frightening and that the dangerous mixture of technology and political ideology has charged the environment with potential disaster. Considering environmental ethic in the broadest sense of the term, the students should comment upon the president's dilemma and ultimately upon his attempt to solve the problem by destroying New York.

4. The political, technological, and, of course, the ethical implications of all this are far-reaching. The trick here, however, is to move into a writing assignment before final judgements have been offered in oral discussion. A major consideration is whether or not our culture can survive conditions of the type set forth in the novel! With such a question in view, have the students write an essay, a mood piece, or perhaps a poem setting forth some thoughts about man's future. The approach to the writing can be left flexible, but the ultimate effect of the writing should be to establish the close connection that exists between the health of the total environment and the survival of culture. The final stage of this unit may be an informal reading and discussing of these papers.

OPTION #1 cont.

DISCUSSION QUESTIONS

1. By the Waters of Babylon

   a. Why does the boy feel compelled to visit the Place of the Gods?

   b. When does the story take place? How do you know?

   c. Where does it take place? Reconstruct the evidence?

   d. How do we find out what happened to this place?

   e. What might have been the cause of this conflict? (The speculations should prove interesting.)

   f. What double meaning is implied in the word gods?

   g. What is the significance of the word Babylon?

   h. What important contrasts do we see between the young boy's environment and the environment of the earlier civilization?

   i. Does the story hold forth any hope?

   j. Is it an effective warning?

   k. Are political conflicts and technological advancements destined to put an end to our civilization?

2. Fail-Safe

   a. What is the real meaning of the word environment as it applies to the novel, Fail-Safe?

   b. Within this environment what are the contributing causes of the fail-safe dilemma?

   c. Which causes are underlying? Which are immediate?

   d. If the technological problem is the immediate cause, what are we to think about the great faith we have placed in technological advances?

   e. What evidence is there within the story that society has lost perspective or that its sense of values has become twisted?

   f. How do suspense and shock techniques give this evidence greater impact?

   g. What values must one consider in developing an environmental ethic?

   h. What is your reaction to the ethic employed by the president in his decision to destroy New York?

   i. How do the numerous instances of human drama serve to heighten the seriousness of the problem?

19

OPTION #1 cont.

POSSIBLE SUBJECTS FOR STUDENT WRITING

1. Examine the effectiveness of either of these works as a commentary on our sense of values.

2. What changes might have to take place in our perspective if we are to avoid a disaster of the type portrayed in Fail-Safe?

3. How can modern man keep technology from becoming his master?

4. As though you were writing a new ending, describe the reaction of the American people to the explanation of why New York was destroyed.

5. What long-range effect might the moral shock of the president's decision have on the future of our culture?

6. Write a mood piece, in prose or poetry, describing an atmosphere or feeling that might emerge from our viewing of these weighty scenes.

7. Any other approach that the teacher or students seem appropriate may be considered.

OPTION #2

MATERIALS AND RESOURCES

Value question list
Value clarification booklet

PROCEDURE:

1. Conduct a period of rank order and value continuum activities as listed on the values strategy sheet.

2. When you get widely differing responses review and discuss the issue.

3. As the period progresses determine their values and adjust the questions to focus on discrepancies between their views and more considered opinions.

4. Do they agree with the behavioral objective? See if they can give examples.

DISCUSSION QUESTIONS - none

VALUES STRATEGY SHEET

RANK ORDER: (Read these to the students one set at a time.)

Rank each of these three statements according to the one you prefer most and least.

1. The use of atomic energy should be confined to:

   war
   medicine
   energy production

2. The United States should allocate more money to improve:

   defense
   transportation
   education

3. To improve the quality of our environment I would spend:

   $5 month
   $5 week
   $25 yearly

4. Wars should be permitted only for:

   acquiring new land.
   defending our land.
   helping smaller countries.

5. Technology has made it possible for us to change our environment. We should now:

   stop and review what we have done.
   continue and learn by doing.
   slow down and be more cautious.

6. I would prefer to live in the time period

   2000 AD
   present
   1880's

7. The use of chemicals to produce food is:

   too dangerous to continue.
   completely safe.
   dangerous but controlled.

22

VALUES CONTINUUM:

Place yourself on the continuum (see values booklet) according to your pro and con position on the issue.

1. Nuclear energy is our best bet for electrical power.

2. Technology will solve our food supply problems.

3. The few harmful effects of misuse of technology are of no real consequence.

4. There have been very few social changes caused by technology.

SECTION #3 - three to four days

MATERIALS AND RESOURCES

The Andromeda Strain, by Michael Crichton
Any additional scientific material the students wish to seek out for background reinforcement

PROCEDURE:

1. Assign The Andromeda Strain well ahead of time. Try not to introduce moral issues until the time of the in-class writing, approximately the third day. On the first day have the class investigate narrative continuity, scientific realism, character development and suspense. In other words, approach the discussion from the standpoint of storytelling technique.

2. Depending on how much time is spent on scientific matters, this opening discussion may take the better part of two periods. The longer the discussion goes on, however, the greater the danger that the class will begin offering premature judgments about our environmental decisions. The initial objective, then, is to nurture interest in The Andromeda Strain as a fascinating tale of suspense without actually inviting commentary on the rightness or wrongness of the Scoop project.

3. When the preliminary discussion has evolved satisfactorily, alter the pace with a full period writing assignment, preferably a formal three-part essay. At this time, pose alternative questions designed to invite judgments about the ethic that man has brought to bear upon his environmental decisions. (See essay questions.) If this area is broached too early in open discussion, it may put a damper on some personal soul searching, without which the writing will be of little value.

4. Survey the papers, select a few of the more thought-provoking and have them read aloud and discussed during the next period. Hopefully, these readings and the attendant discussions will bring to light some serious observations about the relationship between technology and morality.

5. Further evaluation of papers should be based on clarity, soundness of judgments, effectiveness of illustration, sentence structure and the like. If we cannot successfully separate science from morality, neither can we successfully separate matter from form in the art of writing.

DISCUSSION QUESTIONS

1. How does Crichton make this fictional account seem so real?

2. Why does he lavish so much detail on scientific and technical matters?

3. What aspects of character portrayal help to enrich the development of plot?

4. What narrative techniques serve to heighten suspense?

5. What is the purpose of the Scoop project?

6. What was the reason for the Wildfire installation?

24

OPTION #3 cont.

7. What three types of space contamination had to be envisioned prior to Wildfire?

8. What are a few lines of scientific inquiry that precede the ultimate solving of the mystery?

9. What are some examples of "brilliance" and of "stupidity" on the part of the scientists?

10. What purely scientific conclusions do the scientists come to regarding the Andromeda Strain?

11. Aside from physical death, what are some of the more disturbing long-range effects that might acrue foom scientific "progress"? (This final question might be reserved until after the in-class writing.)

IN-CLASS ESSAY QUESTIONS - The students will choose one of the following essay questions to write about.

1. Comment on Jeremy Stone's statement that the "survival value of human intelligence has never been satisfactorily demonstrated".

2. Discuss the ecological implications of Janek's statement that "increasing vision is increasingly expensive".

3. How does Crichton's use of dramatic irony point up the danger of man's "manipulation" of the environment?

4. To what extent is the scientist responsible for the side effects of his exploits?

5. How might Scoop and other similar scientific excursions constitute a threat to man's culture?

ENVIRONMENTAL ETHICS 17

BEHAVIORAL OBJECTIVE:

At the completion of this unit the student will be able to give examples of why an essential aspect of all environmental ethics is a human ethic based on social justice for all individuals and groups.

SUBJECT AREAS:

Social Studies

OPTION #1

MATERIALS AND RESOURCES

Ten feet of white paper
White adhesive tape
Marking pens or pencils

PROCEDURE:

1. Choose a diverse problem like, "What would you do with a person who purposely set a forest fire?"

2. On one side of the continuum put "excute him" and on the other side put "give him a match". Hang the continuum in the front of the classroom.

3. Then have the students come up to the paper and write his name on where he would fall on the continuum.

4. A discussion should follow on the damage of forest fires and fire ecology.

5. The next day the student has the option of covering his name with tape and writing it somewhere else on the continuum.

6. If the student moves his name at any time, ask if he would like to share with the class why he moved it. It is important that the student can answer any questions asked.

7. A discussion could follow on how ethics can change given new knowledge such as the use of fire and its benefits.

8. The continuum may change to another question such as hunting versus non-hunting.

DISCUSSION QUESTIONS

1. What are ETHICS and where do we get them?

2. Is it easy to change an ETHIC? Can you? If so, what are the feelings involved?

3. Name some ethics involved in man's use of his environment.

4. Do ethics always stem from adequate knowledge?

OPTION #2

MATERIALS AND RESOURCES

Filmstrip - Energy and the Land.....?, available E^2 Office
Article on dams, Reader's Digest, June, 1977

PROCEDURE:

1. Ask the students to write down the following terms and leave room for their answers.

Strip mine	PROS	CONS
Deep mine	PROS	CONS
Hydroelectric	PROS	CONS

2. As the students watch the filmstrip, ask them to record the pros and cons of each energy source as they are presented.

3. List these pros and cons on the blackboard.

4. Have the students rank order from most capable of meeting the stated behavioral objective to least capable of the three areas presented.

   BEHAVIORAL OBJECTIVE: An environmental ethic is a human ethic based on social justice for all individuals and groups.

5. Explain that a decision must be made regarding the three energy sources - i.e., which one is best suited to meet human needs? This, therefore, is the environmental ethic aspect needed to fit the objective.

6. Generate debate by opening for class discussion those issues of pros and cons and their subsequent rank order.

DISCUSSION QUESTIONS

1. Has the stripmining company shown a strong environmental ethic?

2. Did they consider the human needs? Please develop here a dualistic argument. For example, human needs may be identified as a need for coal, saves individuals from black lung disease, and destroys the beauty of the area.

3. Was the mining company ever concerned with the people of the small town? Was the federal government? Were you?

4. Have the owners of deep mines developed a good or bad environmental ethic?

5. What reasons were given for a miner's insistence that he stay in the mine despite the obvious hazards?

6. Does the federal government really care about helping the miner? Do you?

28

OPTION #2 cont.

7. Do you think there is enough evidence to support the claim that large watersheds can cause earthquakes?

8. What needs to be done to insure that hydroelectric dams meet a sound environmental ethic?

9. If a large company or government had sound environmental ethics, what would be considered first before laws were made or factories built?

FURTHER ACTIVITIES

The complete set of Human Issues in Science is excellent for generating values clarification.

PTION #3

MATERIALS AND RESOURCES

Cameras and slide film
Slide projector
Cassette tape recorder
Newspapers and magazines
Posterboard
Chart paper and magic markers

PROCEDURE:

1. Have the students do a survey on the number of students there are in the building and find out the average number of pupils per teacher in a given period.

2. After collection of the above data, break up the students into teams of five and have them evaluate the information to see if there is any overcrowding in classrooms in the building by the standards the class develops. (For example, 28 students per teacher may constitute overcrowding.)

3. Discuss the possible reasons for the overcrowded conditions. Ask them whether it is fair to the students to be cramped in an atmosphere that isn't good for their educational growth.

4. Ask the students if the problem of inadequate and overcrowded conditions goes beyond the walls of the school. During this activity record each of the groups' responses on chart paper and hang them around the room. Ask them to explain the reasons for the overcrowding and inadequate housing in the neighborhood.

5. Take students for a walk through the neighborhood surrounding the school. Have them do the following:

   a. Identify the population makeup of the community. For example: All one-culture, multi-culture, or pockets of one-culture and multi-cultures, etc.

   b. Identify the types of housing in the community. (single dwellings, duplexes, apartments, etc.)

   c. Note the number of people on the streets. Look for signs of children such as toys, bikes, etc.

   d. Notice the number of autos, moving, parked, or abandoned found on the streets.

   e. Take photos of the quality of the housing, yards, and streets in the community.

   f. Record the sounds in the neighborhood.

OPTION #3 cont.

6. Before any evaluation of the data collected, ask the students to write their interpretations of the whole experience. Allow a half hour for the completion of this assignment. Have each student discuss his views.

7. Using the slides taken of the community, assist a group of students in putting together a media presentation for the rest of the class discussing the housing and living environments in the neighborhood. Have students make charts and drawings of these conditions for display. Also have a group of students list and draw some alternatives to the present housing issues.

8. Using the newspapers and magazines have students cut out ads that are specifically designed to sell or rent housing in the city. Have students create a large collage of these ads for display when giving their presentation.

DISCUSSION QUESTIONS

1. What is justice?

2. What does equal housing mean?

3. What is racism?

4. What is poverty?

5. What is lead poisoning?

ENVIRONMENTAL ETHICS 18

BEHAVIORAL OBJECTIVE:

At the completion of this unit the student will be able to demonstrate that only when each of us lives a life guided by respect for the earth and all living things, now and in the future, will we be able to live in harmony with each other and our environment.

SUBJECT AREAS:

Science, Social Studies, English

OPTION #1

MATERIALS AND RESOURCES

Copy of "Mousemeal"
TV Guide or other similar publication

PROCEDURE:

1. Have the students read "Mousemeal".

2. Open for discussion.

3. After discussion instruct the students in the use of Survey I.

DISCUSSION QUESTIONS

1. How many hours per day does the average American watch television? (Estimate)

2. Of the hours available for television watching, how many are geared to children's programs? (Use television guide)

3. List some children's programs. (Use television guide)

4. If you have seen any of these programs, summarize their general theme.

5. Is violence a major part of children's and adult's programs?

6. Using some of the objectives the author of "Mousemeal" uses, describe some of the shows.

7. How does the author view cartoons?

8. Did the author seem surprised at the amount of violence? What term or phrase indicates this?

9. Do you think most adults would be surprised at the amount of violence in cartoons? Explain.

10. What attitude does the author's son have toward these programs? Explain.

11. What phrase(s) describes the child's attitude?

12. Does the author make any statement relative to his own childhood?

13. How old do you think the author is? What indications reveal his age?

14. Does the author feel cartoons reflect society's attitudes? Explain.

15. Do you think programs, childrens and adults, reflect the attitude of society?

16. Listed below are some additional topics for discussion in relationship to television programming:

prejudice family structure money ethics sex role of women

status quo abortion

33

OPTION #1 cont.

FOLLOW-UP DISCUSSION - Have the students report the results of their surveys.

1. Do adult or children's programs have the most violence?

2. Do the types of violence differ? Explain.

3. Does violence on television influence our attitudes toward other people?

   Using a Values Continuum, place on one wall the statement (A) Violence on television leads to violence in our actions. Place on the opposite wall the statement (B) Violence on television is an outlet for human violence. Explain each one. Have the students stand on an imaginary continuum line, each point representing a degree of agreement with one side and disagreement with the other.

4. Discuss and debate the various positions the students have taken.

5. Do the characters in the cartoons have human characteristics? List some.

6. Why is it necessary to give cartoon characters human characteristics?

7. Do you think children associate the violence of one cartoon character to another as "human violence"?

8. Do you think if those cartoon characters were depicted as humans, the violence would be more real to children?

MOUSEMEAL

My son invites me to witness with him a children's program, a series of cartoons, on television. Addressing myself to share his harmless pleasures, I am horrified by the unbridled violence and hostility of the imagined world he takes in stride, where human beings dressed in the skins of mice are eaten by portcullises and cowcatchers, digested through the winding corridors of organs, overshoes, boa constrictors and locomotive boilers to be excreted in waters where shark and squid and abalone wait to employ their tentacles and jaws. It seems there is no object in this world unable to become a gullet with great lonely teeth; sometimes a set of teeth all by itself comes clacking over an endless plain after the moving mouse; and though the mouse wins in the end, the tail of one cartoon is spliced into the mouth of the next, where his rapid and trivial agony repeats itself in another form. My son has seen these things a number of times, and knows what to expect; he does not seem disturbed or anything more than mildly amused. Maybe these old cartoons refer to my childhood and not to his (The ogres in them wear Mussolini's face), so that when mice are swallowed by skeletons or empty suits of armor, when a tribe of savage Negro mice is put through a wringer and stacked flat in the cellar, he can take the objective and critical view, while I am shaken to see the giant picassoid parents eating and voiding their little mice time and again. And when the cheery announcer cries, "Well, kids, that's the end," my son gets up obediently and runs outside to play. I hope he will ride over this world as well, and that his crudest and most terrifying dreams will not return with such wide publicity.

Howard Nemerov

Taken from Coping With Television, McDougal, Littell and Company, Evanston, Illinois, 1973, p. 144.

35

OPTION #1

TELEVISION SURVEY

STUDENT DIRECTIONS: Keep a running log of one evening's television programs; in addition, survey Saturday morning children's programs. Use the key shown on the lower portion of this chart.

PROGRAM	TIME	TYPE OF VIOLENCE
EXAMPLE: AP Kojak (adult program)	8 to 9	FF, AM, MK, B, KG

KEY

CP - Children's program
AP - Adult program
AM - Attempted murder
M - Murder
FF - Fist fight
R - Rape

G - Gun
K - Knife
S - Strangulation
B - Bomb
KG - Kidnapping
Other - Describe briefly

36

OPTION #2

MATERIALS AND RESOURCES

Film, "Treehouse", available E^2 Office

PROCEDURE:

1. Before showing the film, have the students write down a place special to them, a place where they go to be alone or describe a place where they would like to spend some time alone.

2. Show the film.

3. The questions listed below can serve as guidelines for the follow-up discussion.

DISCUSSION QUESTIONS

1. What examples of respect toward the environment did you see in the film?

2. What examples of disrespect did you see in the film?

3. What alternatives were there to the destruction of the treehouse?

4. How important is the opinion of the young man?

5. Did you ever have a similar experience?

6. What are the benefits of the destruction?

7. Could there have been any kind of compromise?

8. How does this destruction make you feel?

9. How do your surroundings affect you?

10. Can you think of disrespect for the environment on the school property?

STUDENT ACTIVITIES

1. Have the students write a short essay on what they think the CAT driver was thinking, i.e. the pros and cons of bringing down the treehouse. Students could add to this a definitive ending to the film. Have students compare thoughts.

2. Individually over the weekend the students could take a short field trip on the school property looking for examples of disrespect of property. This trip is for the purpose of sharpening observation skills. Look for examples such as soil erosion, litter, congestion, rundown buildings, etc.

3. List all signs of disrespect to the environment and from the list choose an area on which to do a follow-up study.

OPTION #2 cont.

FOLLOW-UP OUTLINE

1. Choose one topic on the blackboard and fully define the problem. For example: housing development, sewage, etc.

2. Suggest alternative solutions to your problem area.

3. What are the implications to each of your alternatives?

4. Which of your alternatives shows the most respect for the environment? Explain why you think that this is true.

5. What is the first step of action to be taken?

6. What step will you take? Be honest.

7. How do you feel about your decision?

8. Describe a forested area similar to the one in the film. Ask the students to list as many living things as they can that would be affected as a result of the destruction of the forest.

   Is there a value we can place on these living things to convince people who would destory them, not to do so?

OPTION #3 - two to four days

MATERIALS AND RESOURCES

Required

"America's Endangered Species" (film available through E^2 Office)

"Letter to the President" (included)

Optional (The teacher may wish to examine these before showing the film.)

Cox, James A., The Endangered Ones, New York, Crown Publishers, Inc., 1975. (book)

"Extinct, Endangered and Threatened", SVE filmstrips with cassettes.

Endangered Species posters, Instructor Magazine, 1975-76 issues

All optional materials are available through the E^2 Office.

PROCEDURE:

1. In this option it is suggested that the teacher play devil's advocate in order to bring about a stronger student response. He might introduce the film by suggesting that it gives only one side of the issues or by implying that it is somehow ineffective. Actually, the film dramatizes real concern for the plight of the animal kingdom.

2. No doubt, a number of students will be touched by the film and will echo its sentiment. If some of the students take a negative view, an argument could start. Debate at this stage is desirable. It would show how many are actually motivated by compassion for the animal world.

3. If there is no negative reaction among the students, the teacher can pose questions designed to spark debate. If he is convincing he may actually get some of the class to express the idea that many animals serve no useful purpose. "So the elephants die off. Big deal! Let the circus buy a tractor."

4. At a strategic moment, perhaps early in the second session, the teacher can drop the pretense and read to the class""A Letter to the President". This should help to expose whatever callousness had emerged during the debate. Hopefully, it will lead to a reordering of perspectives.

5. If some are still unconvinced, the teacher can call for examples of how the disappearance of a particular animal species could create a serious upset in the balance of nature. The ultimate loser will be man himself. Hence, the need for harmony within the environment.

TION #3 cont.

DISCUSSION QUESTIONS

1. What is the point of the film?

2. Does it make its point effectively?

   (To spark debate, the teacher now plays devil's advocate. He must back off from this position later.)

3. Does the film give only one side of the picture?

4. What about the concept of "survival of the fittest"? Is it no longer applicable?

5. Why is it so important that we work to preserve all existing species of wildlife? Suppose pelicans die out. How can this possibly make any difference in man's realm? Is there any real value in a rhinoceros? Will the world come to an end without lions?

6. If a species cannot survive in a complex world, isn't the world better off without it? (Great care must be taken here.)

7. Considering the great number of endangered species, isn't it a losing battle anyway?

   (In a serious vein - <u>after the letter is read</u>)

8. What is there in the nature of man that should encourage him to respect <u>all life</u>?

9. On this issue, why is apathy particularly dangerous? (The teacher should encourage humanistic as well as naturalistic views.)

10. If the disappearance of additional species should upset the balance of nature, what effect might this have on the quality of man's future life?

11. What additional steps might man take to protect the animal kingdom?

ADDITIONAL ACTIVITIES (optional)

1. Bulletin board display of animals that have died out and/or of animals that are now endangered

2. Oral reports on steps that have been taken or that could be taken to protect specific species of animals

3. Creative writing exercise (in poetry perhaps) dramatizing the plight of an endangered animal

A Letter to the President:

The Great Chief in Washington sends word that he wishes to buy our land. The great chief also sends us words of friendship and good will. This is kind of him, since we know that he has little need of our friendship in return. But we will consider your offer, for we know if we do not do so, the white man may come with guns and take our land. What Chief Seathl says, the Great Chief in Washington can count on as truly as our white brothers can count on the return of the seasons. My words are like the stars - they do not set.

How can you buy or sell the sky - the warmth of the land? The idea is strange to us. Yet we do not own the freshness of the air or the sparkle of the water. How can you buy them from us? We will decide in our time. Every part of this earth is sacred to my people. Every shining pine needle, every sandy shore, every mist in the dark woods, every clearing and humming insect is holy in the memory and experience of my people.

We know that the white man does not understand our ways. One portion of the land is the same to him as the next, for he is a stranger who comes in the night and takes from the land whatever he needs. The earth is not his brother, but his enemy, and when he has conquered it, he moves on. He leaves his fathers' graves behind and he does not care. He kidnaps the earth from his children. He does not care. His fathers' graves and his children's birthright are forgotten. His appetite will devour the earth and leave behind only a desert. The sight of your cities pains the eyes of the redman. But perhaps it is because the redman is a savage and does not understand

There is no quiet place in the white man's cities. No place to hear the leaves of spring or the rustle of insect wings. But perhaps I am a savage and do not understand - the clutter only seems to insult the ears. And what is there to life if a man cannot hear the lovely cry of the whippoorwill or the arguments of the frogs around a pond at night. The Indian prefers the soft sound of the wind darting over the face of the pond, and the smell of the wind itself cleansed by a mid-day rain, or scented with a pine. The air is precious to the redman. For all things share the same breath - the beasts, the trees, the man. The white man does not seem to notice the air he breaths - Like a man dying for many days, he is numb to the smell.

If I decide to accept, I will make one condition. The white man must treat the beasts of this land as his brothers. I am a savage and I do not understand any other way. I have seen a thousand rotting buffaloes on the prairie, left by the white man who shot them from a passing train. I am a savage and I do not understand how the smoking iron horse can be more important than the buffalo that we kill only to stay alive. What is man without the beasts? If all the beasts were gone, men would die from great loneliness of spirit, for what ever happens to the beasts also happens to the man. All things are connected. Whatever befalls the earth befalls the sons of the earth.

This is a letter written to the President of the United States in 1855 by Chief Seathl (Seattle) of the Suwanish tribe of the state of Washington, regarding the proposed purchase of the tribe's land.

Taken from <u>*The Ecologist*</u>*, January, 1975, p. 31.*

41